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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,044	12/01/2003	Natsuki Makino	2003_1739A	1464

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WENDEROTH, LIND & PONACK, L.L.P.  
2033 K STREET N. W.  
SUITE 800  
WASHINGTON, DC 20006-1021

EXAMINER

WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/724,044	Applicant(s) MAKINO ET AL.	
	Examiner Harry D. Wilkins, III	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 17-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 1-16) in the reply filed on 6 July 2006 is acknowledged.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (US 2002/0130049) in view of Kimura et al (US 2001/0024691).

Chen et al teach (see figures 4-8 and related description) an electrolytic processing apparatus including a substrate holder (head assembly 478) for holding a substrate and a first electrode (802) to make contact with the substrate for passing electricity to a processing surface of the substrate, an electrode head including a second electrode (426) and a polishing surface (428) facing the processing surface of the substrate held by the substrate holder, an electrolytic solution injection portion (440) for injecting an electrolytic solution between the processing surface of the substrate held by the substrate hold and the second electrode, a relative movement mechanism (468) for pressing the polishing surface of the electrode head against the substrate held by the substrate holder and a power source (not shown) for applying a voltage between the first and second electrodes. Since the apparatus of Chen et al was used for either

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electrodeposition or electropolishing (see paragraphs 69, 70 or 77) the power supply was adapted for alternating the direction of electric current such that the second electrode was either a cathode or an anode.

Thus, Chen et al fail to teach adding a high resistance structure between the second electrode and the polishing surface.

Kimura et al teach (see figures 42-51 and related description, particularly paragraph 201) interposing a high resistance structure between an electrically-biased substrate and the counter electrode for the purpose of increasing the uniformity of the electrodeposited film.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a high resistance structure as taught by Kimura et al to the apparatus of Chen et al for the purpose of increasing uniformity of the electrodeposited film.

Regarding claims 2-5, Chen et al teach making the polishing pad (428) from a polyurethane foam (see paragraph 74) and supported by a support (444). With respect to claims 2 and 3, it would have been obvious to one of ordinary skill in the art to have utilized the relatively rigid high resistance structure of Kimura et al for the support diffuser plate (444) of Chen et al in order to reduce the number of parts needed for assembling the device.

Regarding claim 7, the press mechanism of Chen et al included a spring (532).

Regarding claim 8, the type of solution used within the claimed apparatus is not accorded patentable weight. See MPEP 2114. However, it is noted that even if the

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limitation were granted patentable weight, Chen et al and Kimura et al teach using an electroplating solution.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (US 2002/0130049) in view of Kimura et al (US 2001/0024691) as applied above to claim 1 and further in view of Matsuda et al (US 6,375,823).

Chen et al and Kimura et al fail to teach that the surface of the high resistance structure facing the substrate was used as the polishing surface.

However, Kimura et al do teach that the high resistance structure was made of porous ceramic materials.

Matsuda et al teach (see abstract and col. 9, line 60 to col. 10, line 24) that polishing surfaces for polishing of semiconductor wafers could have been made from porous ceramic materials instead of polymeric foams.

Therefore, since the surface of the high resistance structure was known in the prior art to be capable of use as a polishing surface, it would have been obvious to one of ordinary skill in the art to have incorporated the high resistance structure of Kimura et al into the apparatus of Chen et al to replace both the support and the polishing pad, and to have utilized the high resistance structure as the polishing surface.

5. Claims 9-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (US 2002/0130049) in view of Kimura et al (US 2001/0024691) and Talieh (US 6,176,992).

Chen et al teach (see figures 4-8 and related description) an electrolytic processing apparatus including a substrate holder (head assembly 478) for holding a

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substrate and a first electrode (802) to make contact with the substrate for passing electricity to a processing surface of the substrate, an electrode head including a second electrode (426) and a polishing surface (428) facing the processing surface of the substrate held by the substrate holder, an electrolytic solution injection portion (440) for injecting an electrolytic solution between the processing surface of the substrate held by the substrate hold and the second electrode, a relative movement mechanism (468) for pressing the polishing surface of the electrode head against the substrate held by the substrate holder and a power source (not shown) for applying a voltage between the first and second electrodes. Since the apparatus of Chen et al was used for either electrodeposition or electropolishing (see paragraphs 69, 70 or 77) the power supply was adapted for alternating the direction of electric current such that the second electrode was either a cathode or an anode.

Thus, Chen et al fail to teach (1) adding a high resistance structure between the second electrode and the polishing surface (2) performing "face up" processing of the substrate.

Kimura et al teach (see figures 42-51 and related description, particularly paragraph 201) interposing a high resistance structure between an electrically-biased substrate and the counter electrode for the purpose of increasing the uniformity of the electrodeposited film.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a high resistance structure as taught by Kimura et al to the apparatus of Chen et al for the purpose of increasing uniformity of the electrodeposited film.

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Talieh teaches (see abstract, figures 1A, 1B and 2) that both “face up” and “face down” electrochemical mechanical processing techniques were known in the art of processing semiconductor wafers, and that both were known to be functional equivalents.

Therefore, it would have been obvious to one of ordinary skill in the art to have taken the “face down” processing apparatus of Chen et al and converted it to a “face up” processing apparatus, such as that shown by Kimura et al by providing a substrate holder for holding a substrate with its processing surface facing upward, an electrode head with the high resistance structure below the second electrode (i.e.-between the second electrode and the substrate) and with a polishing surface facing at the bottom of the high resistance structure (i.e.-facing the substrate processing surface).

Regarding claims 10-13, Chen et al teach making the polishing pad (428) from a polyurethane foam (see paragraph 74) and supported by a support (444). With respect to claims 2 and 3, it would have been obvious to one of ordinary skill in the art to have utilized the relatively rigid high resistance structure of Kimura et al for the support diffuser plate (444) of Chen et al in order to reduce the number of parts needed for assembling the device.

Regarding claim 15, the press mechanism of Chen et al included a spring (532).

Regarding claim 16, the type of solution used within the claimed apparatus is not accorded patentable weight. See MPEP 2114. However, it is noted that even if the limitation were granted patentable weight, Chen et al and Kimura et al teach using an electroplating solution.

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6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (US 2002/0130049) in view of Kimura et al (US 2001/0024691) and Talieh (US 6,176,992) as applied above to claim 9 and further in view of Matsuda et al (US 6,375,823).

Chen et al, Kimura et al and Talieh fail to teach that the surface of the high resistance structure facing the substrate was used as the polishing surface.

However, Kimura et al do teach that the high resistance structure was made of porous ceramic materials.

Matsuda et al teach (see abstract and col. 9, line 60 to col. 10, line 24) that polishing surfaces for polishing of semiconductor wafers could have been made from porous ceramic materials instead of polymeric foams.

Therefore, since the surface of the high resistance structure was known in the prior art to be capable of use as a polishing surface, it would have been obvious to one of ordinary skill in the art to have incorporated the high resistance structure of Kimura et al into the apparatus of Chen et al to replace both the support and the polishing pad, and to have utilized the high resistance structure as the polishing surface.

### ***Conclusion***

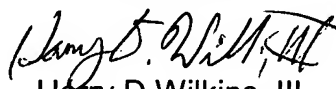
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Harry D Wilkins, III  
Primary Examiner  
Art Unit 1742

hdw